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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/542,542	07/18/2005	Yasuhiko Matsushita	070759-0034	6865

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EXAMINER	
NGUYEN, JOSEPH H	
ART UNIT	PAPER NUMBER
2815	
MAIL DATE	DELIVERY MODE
02/22/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/542,542	MATSUSHITA, YASUHIKO	
	Examiner	Art Unit	
	JOSEPH NGUYEN	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 January 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 July 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/11/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The preliminary amendment filed on 07/18/2005 is acknowledged and thus the objection to the multiple dependencies of claims 5-9 is hereby withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 4 and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kohno et al. (US Patent No. 7,276,742) in view of Bhat et al. (US Publication No. 2003/0025212)

Regarding claims 1-2, Kohno et al. discloses in figure 3 a light emitting diode having a light emitting element fixed to a lead-frame 100 with a conductive adhesive material 101, the light emitting element having a semiconductor layer including a light emitting layer 15 laid on a first surface of a translucent substrate 11 of which a second surface facing away from the first surface is used as a light emission observation surface, wherein the semiconductor layer has a first conductivity type semiconductor layer 14 and a second conductivity type semiconductor layer 16 by laying a first conductivity type compound semiconductor and a second conductivity type compound semiconductor in this order from a translucent substrate side so that the first

conductivity type semiconductor layer and the second conductivity type layer are adjacent to each other with the light emitting layer 15 sandwiched in between with an insulating member 102 filling an opening formed in the second conductivity type semiconductor layer, with a vertical hole 2 formed above the opening so as to penetrate the translucent substrate and the first conductivity type semiconductor layer but not reach the second conductivity type semiconductor layer, and with a conductive material 3 formed along an inner wall surface of the vertical wall so as to conduct to the first conductivity type semiconductor layer. See columns 6-8.

Kohno et al. does not disclose an angle between a normal to the inclined surface and a crystal surface on which the light emitting layer grows equal to an angle in which light emitted by the light emitting layer is totally reflected toward the translucent substrate. However, Bhat et al. discloses in figure 3A a light emitting diode having an angle between a normal to the inclined surface and a crystal surface on which the light emitting layer grows being equal to an angle in which light emitted by the light emitting layer being totally reflected toward the translucent substrate to minimize the loss of the emitted light in a light emitting device (paragraphs [0007] and [0016]). In view of such teaching, it would have been obvious at the time of the present invention to modify Kohno et al. by including an angle between a normal to the inclined surface and a crystal surface on which the light emitting layer grows being equal to an angle in which light emitted by the light emitting layer being totally reflected toward the translucent substrate to minimize the loss of the emitted light in a light emitting device.

Regarding claim 4, Kohno et al. discloses in figure 3 the vertical hole 2 is closed by a pad electrode 34 formed on part of the second surface of the translucent substrate 11 so as to conduct to the conductive material 3.

Regarding claim 6, Kohno et al. discloses the conductive material 3 is plated with copper (column 6, lines 54-57), which is translucent.

Regarding claim 7, Bhat et al. discloses in paragraph [0016] the angle is 35-55 degrees, which is in the claimed range of 40-50 degrees.

Regarding claim 8, Bhat et al. discloses in figure 3A the inclined surface is coated with an insulating film (21).

Regarding claim 9, Kohno et al. discloses the semiconductor layer 15 is formed of gallium nitride compound (column 7, lines 12-13).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kohno et al. and Bhat et al. and further in view of Kawai (US Publication No. 2001/0035580).

Regarding claim 5, Kohno et al. and Bhat et al. together disclose substantially all the structure set forth in claim 5 except the vertical hole being increasingly small with increasing depth. However, Kawai discloses in figure 14 a GaN light emitting diode device having a vertical hole 61 being increasingly small with increasing depth so as to form an electrode in the hole such that the operation voltage of the GaN semiconductor light emitting device can be reduced so much ([paragraph [0086]). In view of such teaching, it would have been obvious at the time of the present invention to modify Kohno et al. and Bhat et al. by including the vertical hole being increasingly small with

increasing depth so as to form an electrode in the hole such that the operation voltage of the GaN semiconductor light emitting device can be reduced so much.

Response to Arguments

Applicant's arguments with respect to claims 1, 2 and 4-9 have been considered but are moot in view of the new ground(s) of rejection. This Action is final because a new ground of rejection is based on the reference (U.S. Patent No. 7,276,742) submitted in an information disclosure statement filed during the period set forth in 37 CFR 1.97 with the fee set forth in 37 CFR 1.17 (p). See MPEP 706. 07 (a).

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (571) 272-1734. The examiner can normally be reached on Monday-Friday, 8:30 am- 5:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker can be reached on (571) 272-2298. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300 for regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/J. N./

Examiner, Art Unit 2815

/Kenneth A Parker/

Supervisory Patent Examiner, Art Unit 2815

February 15, 2008.